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COOLEY LLP				
ATTN: Patent Group				
Suite 1100				
777 - 6th Street, NW				
WASHINGTON, DC 20001				
EXAMINER				
KAUR, GURPREET				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/567,019

**Applicant(s)**

OGLE, DAVID BRUCE

**Examiner**

GURPREET KAUR

**Art Unit**

1759

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 5) ☒ Claim(s) 1-19 and 21 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1-19 and 21 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

**DETAILED ACTION**

***Status of the Claims***

1. Claims 1-19 and 21 are pending.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the inlet and outlet means" in line 9. There is insufficient antecedent basis for outlet means and the limitation "the electrophoresis apparatus" in line 13, there is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 1, 2, 4, 5-9, 12-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voss et al. (USPN 4,990,230) in view of Ogle et al. (US Pub No. 2003/0019753).

Re claims 1 and 9, Voss et al. teaches a square sealing frame, 3 (membrane support) which supports the membrane, 40 has four edges and upper face and lower face;

an inlet port (8) at one side and an outlet port (9) at the opposite end;

spacers (7) positioned between the inlet and outlet port such that the membrane can be applied on both sides of the frame;

inlet means (4) and outlet means (5) are in communication with the inlet and outlet port respectively and with the interstitial space (chamber) formed by the mesh like spacers (see figures 1 and 2, col. 2, ll. 66-68 over to col. 3, ll. 1-4 and 15-22), thus the fluid flows from the inlet port into the chamber and out through the outlet port.

a first flow port (10) and second flow port (11) are opposite to each other and conduct flow of fluid with other chamber (see col. 3, ll. 26-31).

Voss does not teach that the flow ports direct fluid flow to or from an electrophoresis apparatus.

However, Ogle et al. teaches an electrophoresis membrane (ion-permeable membrane) supported on a grid element (602) in an electrophoresis apparatus to allow electrolytes to flow from the electrolyte chamber of the electrophoresis apparatus (see abstract and figures 1 and 6A).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to use the sealing frame of Voss in the electrophoresis apparatus of the Ogle et al. to support the ion-permeable membrane because such substitution would have predictable result of providing the support for the ion-permeable membrane and the flow ports on the sealing frame would allow the flow of electrolytes from the electrolyte chambers of the electrophoresis apparatus onto the permeable membrane of Ogle. Furthermore, the simple substitution of one known element for another is likely to be obvious when predictable results are achieved. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, B.).

Although Voss teaches a square shaped sealing frame and Ogle teaches apparatus that can accommodates rectangular shaped membrane support. However, one of ordinary skill in the art can either modify the shape of sealing frame to be rectangle or modify Ogle apparatus to accommodate square shaped sealing frame, and moreover, the change in form or shape, without any new or unexpected results, is an obvious engineering design. See *In re Dailey*, 149 USPQ 47 (CCPA 1976) (see MPEP § 2144.04).

4. Re claim 2, Voss teach the sealing frames are oriented 90 degree with respect to each other, thus fluid flow is transverse with respect to the adjacent sealing frame (see col. 3, ll. 55-56 and figure 2).

5. Re claim 4, Voss teaches the inlet port (8), outlet port (9) and flow ports (10, 11) are holes or bores in the sealing frame (see figures 1 and 2).
6. Re claim 5, Voss teaches the inlet and outlet ports are circular (see figures 1 and 2), however, the change in form or shape, without any new or unexpected results, is an obvious engineering design. See *In re Dailey*, 149 USPQ 47 (CCPA 1976) (see MPEP § 2144.04).
7. Re claim 6, Voss teach the mesh like spacer, 7 have two sets of parallel spacer lines that run from the inlet to outlet means (see figure 1).
8. Re claims 7 and 8, Ogle et al. teaches the inlet means and outlet means (641, 644) are in triangular channel shape comprised of series of channels (see figure 6A).
9. Re claim 12, Voss et al. teaches a separation unit comprising:
  - a first manifold (end plate, 23) having inlet (60) and outlet port (61);
  - a second manifold (second end plate 23) having inlet (60) and outlet (61);
  - pluralities of sealing frames are disposed between the two end plates along with membranes, 40 to form separation chambers (see figure 5 and 3 and col. 3, ll. 62-67);Voss teach the sealing frames are oriented 90 degree with respect to each other, thus fluid flow is transverse with respect to the adjacent sealing frame (see col. 3, ll. 55-56 and figure 2).

Voss teaches the separation unit can be used for other than electrolysis (see col. 1, ll. 46-51), thus separation device of Voss can be modified to perform electrophoresis based on the teachings of Ogle as indicated above in claim 1.

10. Re claim 13, Voss teaches forming chambers by stacking membranes on membrane supports (see col. 4, ll. 28-38) and Ogle teaches forming three separation chambers using four membranes (721a-721d) and three membrane supports (701,c, 701b, 710a) (see figure 1), thus one of ordinary skill in the art can modify the arrangement such that two separation chambers are to be formed which would require only two membrane support and three membranes.

11. Re claim 14, Ogle teaches plurality of inlets (522a-522f) and outlets (523a-523f) are formed in the cathode block and inlets (522g-522l) and outlets (523g-523l) are formed in the anode block which are communicating with their respective chambers (see figure 5), similarly in figure 1 the inlet and outlet (122a and 123a) and the inlet and outlet (122b and 123b) are also mounted in the cathode block and are communicating with their respective chambers.

12. Re claim 15, Ogle teaches forming plurality of inlets and outlets in the cathode and anode blocks wherein the cathode block inlets and outlet are communicating with first six chambers and the anode block inlets and outlet are communicating with bottom six chambers (see figure 5 and paragraph 0112). Ogle does not teach forming first and

second inlets and outlets communicating with the first and second chamber in the second manifold.

However, one of ordinary skill in the art can envision in a two chamber system to either form the inlets and outlets in the cathode block or the anode block. Furthermore, the mere rearrangement of parts, without any new or unexpected results, is within the ambit of one of ordinary skill in the art. See *In re Japikse*, 86 USPQ 70 (CCPA 1950) (see MPEP § 2144.04).

13. Re claim 16, Voss teaches electrode associated with each end plate (see col.3, ll. 57-62).

14. Re claim 17, Ogle teaches electrophoresis apparatus configuration in figure 1 comprising of four chambers (120a-d) requiring 5 membranes (121a-e), however one of ordinary skill in the art can modify the apparatus just to have first two chambers which would require only three membranes (121a-c) thus it would comprise:

a cathode block having first inlet (122a), a first outlet port (123a) communicating with first chamber, a second inlet port (122b), second outlet port (123b) communicating with second chamber, a third inlet port (115) and a third outlet port (116) communicating with first electrolyte chamber (113) which comprise cathode (125);

an anode block having an inlet port (117) and outlet port (118) communicating with second electrolyte chamber (114) which comprise anode (126);

a first ion-permeable membrane (121a) disposed adjacent to cathode block



a second ion-permeable membrane (121b) disposed adjacent to first permeable membrane;

a third ion-permeable membrane (121c) disposed adjacent to anode block;

a first membrane support (701c) between the first two membranes;

a second membrane support (701b) between second and third membrane;

a first fluid chamber (120a) receives first stream between the first and second membranes;

a second fluid chamber (120b) receives second stream between second and third membranes (see paragraphs 0099 and 0129 and figures 1 and 7);

Ogle further teaches separation chambers can be arranged such that flow of liquid is anti-parallel in the two chambers (see paragraph 0100).

15. Re claim 18, Ogle teaches the membrane is isoelectric membrane (see paragraph 0036).

16. Re claim 21, Voss in view of Ogle teaches an electrophoresis method wherein the sample is passed through the separation chamber, applying electric field and causing the migration of at least one component through the ion-permeable membrane (see paragraphs 0057-0061).

17. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voss and Ogle as applied to claim 1 above, and further in view of Sui et al. (USPN 4,747,929).

Re claim 19, Ogle teaches cartridge for holding membranes positioned in electrophoresis device comprising:

housing adapted to receive plurality of membranes and membrane support (grid element), the housing containing a membrane support with spacer (grid element), first and second inlets (122a, 122b) and outlets (123a and 123b) respectively and two separation chambers (120a and 120b) (see paragraphs 0099 and 0129 and figures 1 and 7); and

Ogle further teaches separation chambers can be arranged such that flow of liquid is anti-parallel in the two chambers (see paragraph 0100).

Ogle does not teach retention support adapted to retain plurality of membranes and containing flow spacers.

However, Siu et al. teaches a spacer, 18 (retention support) with screen 19 (flow spacer) provided at the bottom of the stack assembly comprised of the membranes (26) and spacers (22) (see col.4 ll. 43-55).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to add a extra spacer (18 with screen 19) of Siu to the Ogle assembly because extra spacer effects turbulent flow of liquid passing through the spacer, furthermore, spacer being at the bottom of the stack assembly would inherently help to retain the membranes and spacers.

18. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voss and Ogle as applied to claim 1 above, and further in view of Haberle (USPN 6,365,043).

Re claims 10 and 11, Voss in view of Ogle does not teach drain port communicating with drain channel.

However, Haberle teaches a filter frame comprising of filter drain channel (9) connected with the filter outlet (4) (see figure 1).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to form a filter drain channel of Haberle onto the Voss sealing frame to drain liquid out.

19. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Voss and Ogle as applied to claim 1 above, and further in view of Tyson Jr. et al. (USPN 3,834,544).

Re claim 3, Voss and Ogle teach inlet and outlet as channels but does teach flow ports are provided as channels. However, as indicated by Tyson Jr. et al. ports can be designed as elongated conduits (44) in a frame, thus it would be obvious to one of ordinary skill in the art to design the ports as either circular ports or elongated channels as taught by Tyson Jr. et al. Furthermore, the change in form or shape, without any new or unexpected results, is an obvious engineering design. See *In re Dailey*, 149 USPQ 47 (CCPA 1976) (see MPEP § 2144.04).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GURPREET KAUR whose telephone number is (571)270-7895. The examiner can normally be reached on Monday-Friday 9:00-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey T. Barton can be reached on (571)272-1307. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. K./  
Examiner, Art Unit 1759

/Alex Noguera/  
Primary Examiner, Art Unit 1759  
September 8, 2011